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Federal Communications Commission
445 12th Street SW
Washington, DC 20554

RE: ET Docket 02-380 & WT Docket 02-381

Dear Commission:

Alvarion, the active global leader in wireless broadband, commends the Commission on its efforts to seek public comment on a variety of important topics centered on license exempt frequency spectrum. We further appreciate that the request for comments result from the very meaningful work done by the special Spectrum Policy Task Force, which Alvarion, Inc.'s Chief Evangelist Patrick Leary was proud to serve as an expert panelist for one of the public unlicensed spectrum workshops speaking on behalf of Alvarion and the wireless broadband industry at large via affiliation as an executive committee member of the Wireless Communication Association's, License Exempt Alliance (<http://www.wcai.com/lea/index.htm>). Alvarion and the WCA/LEA share the Commission's commitment to foster deployment of broadband services to rural communities using license exempt spectrum, as well as improving the availability and competitive environment for broadband in all markets. To that end, we respectfully offer our comments and experiences regarding unlicensed bands as the leading and most industry active wireless broadband vendor via this filing.

Alvarion has offered the marketplace specific license exempt wireless broadband solutions leveraging the enabling rules of Part 15.247 since 1999. To date, we are able to count approximately eight hundred (800) distinct U.S. operators that have purchased and deployed our systems, mostly in rural markets. Though data is difficult to precisely validate due to the market contraction of the last three years, Alvarion estimates approximately 75% of these operators remain in service, with a great many growing at pace with their business models.

Based on shipped serial numbers, approximately 200,000 wireless units have been shipped into our U.S. channels. Until very recently, most of these units operated within the ISM 2.4GHz-2.4835GHz band. These are not Wi-Fi™ specific units, though the technology shares a technical lineage. Our primary market solution, called BreezeACCESS™, leverages the liberal allowances of Part 15 rules to enable Alvarion to produce a very sophisticated and interference robust solution designed to thrive in the challenge of provisioning wireless broadband across many square miles using the shared spectrum. Currently, BreezeACCESS™ permits concurrent operation in multiple bands, including the unlicensed bands of 2.4GHz and the 5GHz ISM bands. Shortly after the date of this filing, the solution expands into the 900MHz ISM range, as well as the 5.25GHz-5.35GHz UNII band. As well, many licensed bands versions (which may also be concurrently used with unlicensed versions) are offered, though only the MMDS band ranges are applicable to U.S. markets.

It is important that the Commission understand the nature of the companies deploying these systems, where they are implementing them, and how. Initially, the primary deployers of our system were small, private, rural ISPs. While true that these WISPs (wireless Internet service providers) had tired of sharing dialup revenue with their local incumbent telco, a principal motivation was the near total lack of high-speed Internet service availability. To them, these are more than just markets, they are hometowns where they live, work, play, and pray. Their children were attending schools without viable Internet access (and all the educational opportunity therein) relative to their peers in the metro regions.

These maverick wireless pioneers began to take equipment like our legacy wireless LAN (“last 100 feet”) products and adapt it for suitability to create wireless coverage over many square miles in point-to-multipoint fashion. Alvarion (then BreezeCOM) responded to their needs by building a specific carrier-grade solution for the wireless broadband (“last mile”) application. Today, a single six (6) sector tower with a BreezeACCESS™ base station can service 300 square miles, topography permitting. Such systems can be deployed in mere days and for a fraction of the cost of other infrastructure solutions.

And while today, WISPs still form the primary mass of providers in terms of number of companies, the maturation of today’s systems have encouraged less risk-averse local companies to enter the market. This new group of entrants, while sharing the rural component, tend to be much better funded and with established local reputations for delivering some type of infrastructure service. These include local telephone companies, co-op and municipal utilities, cable companies, and rural cellular service providers. Each of these has a unique set of compelling motivations to provision wireless broadband using unlicensed bands. Each of these operator types has the ability to leverage considerable capital and other assets to grow rapidly as high quality providers of wireless broadband in their markets.

Without the availability of these systems using unlicensed bands, almost none of these operators and the many hundreds using competitive products would be in the business of wireless broadband. Any licensed spectrum that might have been available was, and is, simply too expensive. And importantly, the limited availability of the spectrum, especially coupled with the aggregation by only a few companies, has discouraged many vendors from building products for the few available licensed bands. There is simply too much risk to invest millions in product development when only a few opportunities exist to make sufficient sales to recover and profit from the investment. Contrast to this with the unlicensed bands whose mass availability has fostered extensive competition, and all the resulting choices and competitive prices.

The following provides four (4) very considerable and distinct examples of Alvarion-based unlicensed wireless broadband operators and their accomplishments in providing their rural communities with reliable high-speed Internet access, VPNs and other broadband services. It is important to recognize that these examples, and the many hundreds not mentioned, are not Wi-Fi short distance public hotspots such as those available in some hotels, airports and other microcells locations. These are implementations of much more sophisticated, interference robust, and spectrally efficient unlicensed systems (whose innovations were made possible by the Part 15 rules) to provide wireless broadband over many miles in areas where often no other broadband exists. In fact, these types of deployments are one of the methods that feed and enable hotspots in locations that would otherwise not be possible. In each case, the wireless broadband service they provide is often the only means for the local schools, governments, businesses and homes to obtain broadband. In some cases, these operators do compete directly with other broadband providers, including cable, xDSL, as well as other wireless. Both types of unlicensed deployments, Wi-Fi hotspots and last mile broadband deployments are important, but the thousands of true “last mile” wireless implementations liberating communities with broadband are seldom recognized and must be acknowledged and understood:

Example 1. A WISP – Amarillo Online (a.k.a. AMA Online), Texas <http://amaonline.com>

A subsidiary of one of America’s largest grain producers, AMA services approximately (they continue to grow rapidly) 4,000 buildings covering thousands of square miles and dozens of small towns in and around the greater Amarillo area. Many of their base stations are located on grain elevators. AMA is the largest license exempt wireless broadband carrier in a single market in the U.S.A. In 2003, AMA begins expansion into other Texas markets.

Example 2. A Utility – Wheatland Electric, Kansas <http://www.wbsnet.org/>

As the local cooperative electric utility provider, Wheatland provides power to the 40,000 businesses, schools, and residences of an 11 county ultra rural area western Kansas. Though relatively new, their Wheatland Broadband subsidiary now has approximately 1,000 buildings online in only the first initial phase of deployment. This is remarkable in an area where town population is often measured in hundreds and in view that broadband “take rates” are still fairly low nationwide. Customers as far as 18 miles away can be serviced.

Example 3. A Rural Cellular Company – Midwest Wireless, Minnesota <http://midwestwireless.com>

Based in Mankato, MN, Midwest is one of the Midwest’s largest rural cellular companies and a leading employer in town. In fact, their president also serves as the leader of the Rural Cellular Association. Midwest Wireless provides wireless broadband services to over 40 towns throughout rural Minnesota and Iowa. With over 200 cell towers to leverage, provisioning wireless broadband was a natural fit, however even a company like Midwest had no access to suitable licensed bands.

Example 4. A Telco – FairPoint Communications, North Carolina

FairPoint is the latest example of adoption by established infrastructure providers. FairPoint is a consortium formed by 29 rural local telephone companies providing telco solutions to more than 123 communities in 18 states. Like most telcos, the motivation for this group of telcos to implement unlicensed wireless is to overcome their very limited xDSL range in order to offer broadband availability to the majority of customers. Also like most rural telcos, these telcos do not have access to licensed bands. Over 100 local telcos nationwide are engaged in aggressive deployment of unlicensed wireless broadband using Alvarion.

While these are some of Alvarion’s larger U.S. examples of wireless broadband operators using our BreezeACCESS™ solution, there are hundreds of smaller operators that are no less important to their communities. Many may never see large scale because they are there to service their specific small market. Small does not mean inconsequential or unprofessional however, in fact quite the opposite; the small shops often serve as their community’s source for other computer services, as well as traditional dial up access. For example, ShreveNet (<http://www.shreve.net>) in Shreveport, Louisiana services most of the town’s key businesses, hospitals and schools with high-speed Internet via wireless and xDSL and is a facilities-based CLEC. Operated by the WISP pioneer Allen Marsalis, ShreveNet has one of the country’s most sophisticated unlicensed wireless broadband operations and was voted the “WISP of the Year” by its peer WISPs around the nation.

In addition to private sector providers, Alvarion has a number of operators that are municipally owned. The best example of this is Allegany County, Maryland’s Allconet (<http://prime.allconet.org/allconet2/>). By their own definition, Allconet operates in the “economically depressed rural area in the foothills of the Appalachian Mountains.” Allconet is the most sophisticated municipally owned unlicensed wireless broadband system in North America, with every single government and non-profit connected via unlicensed wireless, including every school, every library, every public office, every police station house, city hall, etc. – over 90 buildings in total. Allegany County does not have a single leased line, saving the community many, many thousands of dollars each month. This is a carrier-class network, with better than 99.99% statistical and historical uptime. A fully redundant ring supports the Allconet system, which is also wireless. The success has been such that the county has voted to become their own carrier so they may offer affordable unlicensed wireless broadband to the residents of the county. With the help of state grant monies above their own county funding, the system is growing in 2003 “to provide access to the Internet to approximately 85% of the residents and 95% of the businesses and 100% of the government and industrial parks in Allegany County.”

Then there are the tiny towns like Pratt, KS, small cities like Midland, TX, and even large counties like San Diego that have deployed our mobile unlicensed systems to connect police and even fire department vehicles so officers can access critical data like mug shots, route maps, finger print data, and other bandwidth intensive applications. As well, the systems allow departmental staff to update remote computers with software like virus file and application updates, while mobile. Sgt. Muenzer, the

administrator of the San Diego deployment that connects over 450 sheriff's department vehicles, says their system is adding two (2) hours of productivity *per day* to every officer with a connected vehicle. In Pratt, KS, a town with less than 4,000 people, the solution is delivering more functionality than any other option they studied, and for a fraction of the cost. It works so well; in fact, they have cancelled all cell phones and added VoIP phones in the vehicles connected to the wireless. This has the added benefit of allowing Pratt's police officers to conduct sting operations in total private, using their traditional radio to send fake transmissions to fool suspects that might be using scanners.

These are just a few examples of how wireless broadband, using unlicensed bands, is very literally changing the broadband dynamic and bridging the divide long suffered in rural America. So how does the FCC best help these entrepreneurs and communities gain further benefit?

1. Open up more band sub-1GHz

While technical advances in radio modulation offer the rural provider more and better choices than ever for providing service, there remains a significant obstacle that even the most advanced modulations provide little help overcoming. Many rural environments are so heavily foliated that current bands are insufficient for operators to create workable business models. The 2.4GHz and 5GHz bands do not allow providers to connect a large percentage of businesses and residences from their towers, even at close distance (up to 2 miles). This either forces providers to a) build far more base station capacity than necessary in an effort to get closer to the customers, which means prohibitive capital outlays relative to the demographics, or b) ignore the potential market, connecting only those their towers can "see" from an RF perspective.

This reason alone accounts for the fact that, in the eastern states and the Pacific Northwest where tree canopy tends to be dense, very little wireless broadband service using unlicensed bands is available. In fact, approximately ¾'s of all unlicensed wireless broadband deployments exist between east of the Rocky Mountains and west of the Mississippi. And while 900MHz offers much better propagation characteristics through foliage, only 26MHz of band is available versus the 83.5MHz of availability in 2.4GHz and 225MHz of availability in the mid-UNII and upper ISM bands.

2. Allow higher power for multipoint operation for spectrally, spatially, and time efficient products

The ability to enable higher power is important, especially for rural operators needing to cover vast geography with low customer density. The small customer density means these operators cannot economically justify the building of great numbers of small cells — the site lease and backhaul costs are prohibitive. Instead, fewer cells must be able to access customers farther away. *However*, Alvarion believes it is a mistake to permit wholesale higher power simply based on the market demographic because this could result in deployment of very inefficient systems that would pollute the airwaves. Instead, the FCC should reward the opportunity to use higher power to those implementing efficient systems. This would protect the ability of innovative and efficient competition to enter an incumbent market.

We believe such a rule should be ratio based, with some sensible baseline consistent to today's rules. For example, current ISM rules for point-to-multipoint allow for a maximum EIRP of 36dB. But this rule applies no matter the efficiency of the system, with the result that some systems are extremely spectrally inefficient, limiting the ability of competition to engage the market and providing no incentive to improve efficiency.

There is precedent for such a ratio-based rule, as evidenced by the "3 to 1" rule for point-to-point operation in the ISM bands. This rule enables connect of facilities at great distance without "polluting" the spectrum since the antenna beamwidth gets progressively more spatially efficient as the power increases. Applied to multipoint, progressively higher power enabled by efficiency will enable the rural operator to access more customers at greater range while also promoting product innovation and efficient use of spectrum.

3. Permit licensed holders in 700MHz to deploy before the broadcasters vacate the spectrum

Product development is at such a level that systems can be built using current technology that can allow for operation in active spectrum without affecting the incumbent broadcaster. Simple technical implementations can be provided that can enable base stations to “listen” for broadcasts and skip over exact frequencies that are active. This can happen in the time domain. This is consistent with the FCC Spectrum Policy Task Force’s (SPTF) recommendation to leverage the time dimension. It also recognizes the interference “temperature” ability of modern systems as noted by the SPTF.

Arguments against such operation, put forward by broadcasters, do not recognize the technical advancement of modern systems at best, and it is an argument without proof as well. At a minimum, the FCC should encourage deployment of such systems on an “experimental” basis. Trials of innovative solutions, such as a dynamically switching system that avoids active spectrum is also consistent with SPTF recommendations that seek to encourage experimentation.

Unlicensed bands are being well used throughout the country by rural operators, even in secure mobile implementations for public safety applications. Many of these are well-established, mature deployments. These providers are comprised of many different operator types, including every type of infrastructure company, from start of special network operators, ISPs, utilities, telcos, CLECs, rural cellular companies, cable companies, and municipal governments. The local nature of individual operators has meant, unfortunately, that the tremendous aggregate scale of deployments has occurred under the radar of the media and the FCC. Individual operators, except for those very few entrepreneurial startups with larger coverage ambitions, seldom seek national PR and thus go unnoticed. This is in wide contrast to the many new national aggregators of Wi-Fi hotspots, many who are just starting operations, but are nonetheless well known and receive heavy press awareness.

It is specifically the unlicensed nature of the bands that have enabled these operators to provide competitive broadband in their communities, many which before had no broadband option. Likely none of the hundreds of Alvarion-based license exempt operators, and the many hundreds of others using other brands, would have been able to bring broadband to their underserved market, except for the very limited percentage able to deploy cable or xDSL. Even those could only have offered their markets a very range-limited wireline implementation of broadband. These operators are succeeding without subsidy support and are shining examples of the best of American enterprise – they recognized opportunity where others did not and moved to seize that opportunity in service to their communities. The FCC should formally encourage the expansion of the license exempt wireless broadband application by opening up more band and promoting efficient use of such bands through a progressive set of rules.

As the world’s leading wireless broadband vendor in bands sub-10GHz (licensed and unlicensed), Alvarion is a longtime, firsthand witness to the widespread implementation of unlicensed wireless broadband. We can provide massive empirical, anecdotal evidence of the success of unlicensed bands in this application, and as such, we trust the Commission will value our input. We appreciate the opportunity to submit our comments to the public record and welcome and extend to the Commission the offer of further information as needed.

Respectfully,

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